

**$\Delta(2000) 5/2^+$**  $I(J^P) = \frac{3}{2}(\frac{5}{2}^+)$  Status: \*\*

## OMITTED FROM SUMMARY TABLE

The latest GWU analysis (ARNDT 06) finds no evidence for this resonance.

NODE=B139

 **$\Delta(2000)$  BREIT-WIGNER MASS**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>≈ 2000 OUR ESTIMATE</b>			
1724 ± 61	VRANA 00	DPWA	Multichannel
2200 ± 125	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
2015 ± 24	SHRESTHA 12A	DPWA	Multichannel
1752 ± 32	MANLEY 92	IPWA	$\pi N \rightarrow \pi N \& N\pi\pi$

NODE=B139

NODE=B139M

NODE=B139M  
→ UNCHECKED ←

OCCUR=2

 **$\Delta(2000)$  BREIT-WIGNER WIDTH**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
138 ± 68	VRANA 00	DPWA	Multichannel
400 ± 125	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
500 ± 52	SHRESTHA 12A	DPWA	Multichannel
251 ± 93	MANLEY 92	IPWA	$\pi N \rightarrow \pi N \& N\pi\pi$

NODE=B139W

NODE=B139W

OCCUR=2

 **$\Delta(2000)$  POLE POSITION**

REAL PART	DOCUMENT ID	TECN	COMMENT
<u>VALUE (MeV)</u>			
1697	VRANA 00	DPWA	Multichannel
2150 ± 100	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1976	SHRESTHA 12A	DPWA	Multichannel

NODE=B139215

NODE=B139RE  
NODE=B139RE

OCCUR=2

-2×IMAGINARY PART	DOCUMENT ID	TECN	COMMENT
<u>VALUE (MeV)</u>			
112	VRANA 00	DPWA	Multichannel
350 ± 100	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
488	SHRESTHA 12A	DPWA	Multichannel

NODE=B139IM  
NODE=B139IM

OCCUR=2

 **$\Delta(2000)$  ELASTIC POLE RESIDUE**

MODULUS   $r$	DOCUMENT ID	TECN	COMMENT
<u>VALUE (MeV)</u>			
16 ± 5			
	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$

  

PHASE $\theta$	DOCUMENT ID	TECN	COMMENT
<u>VALUE (°)</u>			
150 ± 90	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$

NODE=B139220

NODE=B139RER  
NODE=B139RER

OCCUR=2

NODE=B139IMR  
NODE=B139IMR

OCCUR=2

 **$\Delta(2000)$  DECAY MODES**

NODE=B139225; NODE=B139

Mode
$\Gamma_1 N\pi$
$\Gamma_2 N\pi\pi$
$\Gamma_3 \Delta(1232)\pi, P\text{-wave}$
$\Gamma_4 \Delta(1232)\pi, F\text{-wave}$
$\Gamma_5 N\rho, S=3/2, P\text{-wave}$
$\Gamma_6 p\gamma$
$\Gamma_7 p\gamma, \text{ helicity}=1/2$
$\Gamma_8 p\gamma, \text{ helicity}=3/2$

DESIG=1

DESIG=3

DESIG=11

DESIG=12

DESIG=2

DESIG=4

DESIG=5

DESIG=6

**$\Delta(2000)$  BRANCHING RATIOS** **$\Gamma(N\pi)/\Gamma_{\text{total}}$** 

VALUE (%)	DOCUMENT ID	TECN	COMMENT	$\Gamma_1/\Gamma$
0±1	VRANA 00	DPWA	Multichannel	
7±4	CUTKOSKY 80	IPWA	$\pi N \rightarrow \pi N$	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
7±1	SHRESTHA 12A	DPWA	Multichannel	
2±1	MANLEY 92	IPWA	$\pi N \rightarrow \pi N \& N\pi\pi$	

 **$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$  in  $N\pi \rightarrow \Delta(2000) \rightarrow \Delta(1232)\pi, P\text{-wave}$** 

VALUE	DOCUMENT ID	TECN	COMMENT	$(\Gamma_1\Gamma_3)^{1/2}/\Gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				

 $+0.07 \pm 0.03$  MANLEY 92 IPWA  $\pi N \rightarrow \pi N \& N\pi\pi$  **$\Gamma(\Delta(1232)\pi, P\text{-wave})/\Gamma_{\text{total}}$** 

VALUE (%)	DOCUMENT ID	TECN	COMMENT	$\Gamma_3/\Gamma$
0±1	VRANA 00	DPWA	Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •				

 $3\pm3$  SHRESTHA 12A DPWA Multichannel | **$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$  in  $N\pi \rightarrow \Delta(2000) \rightarrow \Delta(1232)\pi, F\text{-wave}$** 

VALUE	DOCUMENT ID	TECN	COMMENT	$(\Gamma_1\Gamma_4)^{1/2}/\Gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				

 $+0.09 \pm 0.04$  MANLEY 92 IPWA  $\pi N \rightarrow \pi N \& N\pi\pi$  **$\Gamma(\Delta(1232)\pi, F\text{-wave})/\Gamma_{\text{total}}$** 

VALUE (%)	DOCUMENT ID	TECN	COMMENT	$\Gamma_4/\Gamma$
40±1	VRANA 00	DPWA	Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •				

 $< 3$  SHRESTHA 12A DPWA Multichannel | **$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}}$  in  $N\pi \rightarrow \Delta(2000) \rightarrow N\rho, S=3/2, P\text{-wave}$** 

VALUE	DOCUMENT ID	TECN	COMMENT	$(\Gamma_1\Gamma_5)^{1/2}/\Gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				

 $-0.06 \pm 0.01$  MANLEY 92 IPWA  $\pi N \rightarrow \pi N \& N\pi\pi$  **$\Gamma(N\rho, S=3/2, P\text{-wave})/\Gamma_{\text{total}}$** 

VALUE (%)	DOCUMENT ID	TECN	COMMENT	$\Gamma_5/\Gamma$
60±60	VRANA 00	DPWA	Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •				

 $90 \pm 3$  SHRESTHA 12A DPWA Multichannel | **$\Delta(2000)$  PHOTON DECAY AMPLITUDES** **$\Delta(2000) \rightarrow p\gamma, \text{ helicity-1/2 amplitude } A_{1/2}$** 

VALUE ( $\text{GeV}^{-1/2}$ )	DOCUMENT ID	TECN	COMMENT	
• • • We do not use the following data for averages, fits, limits, etc. • • •				

 $-0.061 \pm 0.018$  SHRESTHA 12A DPWA Multichannel | **$\Delta(2000) \rightarrow p\gamma, \text{ helicity-3/2 amplitude } A_{3/2}$** 

VALUE ( $\text{GeV}^{-1/2}$ )	DOCUMENT ID	TECN	COMMENT	
• • • We do not use the following data for averages, fits, limits, etc. • • •				

 $0.158 \pm 0.032$  SHRESTHA 12A DPWA Multichannel | **$\Delta(2000)$  REFERENCES**

SHRESTHA 12A PR C86 055203	M. Shrestha, D.M. Manley	(KSU)
ARNNDT 06 PR C74 045205	R.A. Arndt <i>et al.</i>	(GWU)
VRANA 00 PRPL 328 181	T.P. Vrana, S.A. Dytman,, T.-S.H. Lee	(PITT+)
MANLEY 92 PR D45 4002	D.M. Manley, E.M. Saleski	(KSA) IJP
Also PR D30 904	D.M. Manley <i>et al.</i>	(VPI)
CUTKOSKY 80 Toronto Conf. 19	R.E. Cutkosky <i>et al.</i>	(CMU, LBL)
Also PR D20 2839	R.E. Cutkosky <i>et al.</i>	(CMU, LBL)

NODE=B139230

NODE=B139R2

NODE=B139R2

OCCUR=2

NODE=B139R11

NODE=B139R11

NODE=B139R5

NODE=B139R5

NODE=B139R12

NODE=B139R12

NODE=B139R6

NODE=B139R6

NODE=B139R7

NODE=B139R7

NODE=B139235

NODE=B139A01

NODE=B139A01

NODE=B139A02

NODE=B139A02

NODE=B139

REFID=54862

REFID=51535

REFID=47593

REFID=41535

REFID=30071

REFID=30064

REFID=40096